

Dihybrid Crosses

Dihybrid Crosses: Activity

Targeted *Standard Course of Study* Goals and Objectives:

Goal 1: Learner will develop abilities necessary to do and understand scientific inquiry.

1.01 Identify biological problems and questions that can be answered through scientific investigations.

1.02 Design and conduct scientific investigations to answer biological questions.

Goal 3: Learner will develop an understanding of the continuity of life and the changes of organisms over time.

3.03 Interpret and predict patterns of inheritance.

Essential Question(s):

What is the significance of scientific investigation?

How does a scientist design and perform an inquiry-based scientific investigation considering controls, variables, and data analysis?

How do genes and the environment interact to produce a phenotype?

Can we simulate a model illustrating the principle of independent assortment while supporting the probability of a dihybrid heterozygous cross?

Introduction:

In this activity, you will study two different genes in corn, each with two alleles.

Purple and white are alleles of a gene that influences the color of the grains (kernels). Purple is dominant to white.

Smooth and wrinkled are alleles that also influence the appearance of the grains. The smooth grains are round and plump in appearance because of the accumulation of starch. The wrinkled ones are shrunken because of the accumulation of sugar. Smooth is dominant to wrinkled.

These two pairs of alleles will illustrate the most common type of inheritance—the type observed when two genes are on different chromosomes. One pair of chromosomes carries the alleles for color. The alleles for texture are carried on a different pair of chromosomes. Since the different pairs of alleles are carried on separate pairs of chromosomes, they are inherited independently from each other.

Your parent corn plants will be heterozygous for both seed color and texture.

Materials:

2 silver coins (heads = P and tails = p)

2 pennies (heads = S and tails = s)

Styrofoam cup (for coin shaking)

Tray with sides (to pour coins into)